Knowledge Transfer from a Perspective of Quadruple Helix: Initial Findings from the Financial Services Sector in Bahrain

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Abstract. The study aims to explore the interactions involving key "Quadruple helix" actors in the financial services sector in Bahrain. As the study has an exploratory purpose, a qualitative methodological approach was employed using the key principles of "Grounded Theory". The initial findings show that the inter-organizational knowledge transfer between the diverse stakeholders is often considered problematic. The interactions were mostly perceived as a double and a triple helix, while limited focus was given to quadruple helix interactions. Moreover, the networking dynamics revealed many examples of unidirectional interactions and less of bidirectional interactions where all collaborating partners learn from each other. These interactions can offer valuable insights into power relations, as power differences emerge in exchange networks that are enormously in one direction. This study sheds light on the tensions and gaps associated with quadruple helix interactions. The study has implications for policy makers and practitioners by identifying the need to implement interventions to overcome the gaps and tensions that affect the willingness to engage in knowledge transfer.

Keywords: The Quadruple Helix, Knowledge Transfer, Knowledge Boundaries, Power, Intermediaries.

1 Introduction

The aim of this research is to explore the financial services sector context in Bahrain where multiple diverse quadruple helix stakeholders are interacting (Figure 1 below), understanding the processes of knowledge transfer and the roles undertaken in mediating power asymmetry. By maintaining effective links with pertinent stakeholders locally and internationally, the first actor in the quadruple helix is a Higher Education Institute (HEI). The institute was established to serve a second actor, the financial services sector, as its main client. The institute is supported by a 1% levy imposed on Bahrain's financial institutions, to develop programmes which mostly cater for the financial services sector's specific requirements.

The institute maintains effective channels of communication with a third actor, the regulator, represented by the financial services regulator and the academic regulatory

bodies. The fourth actor is represented by public/civil society partners, who are limited to learners and government institutions.

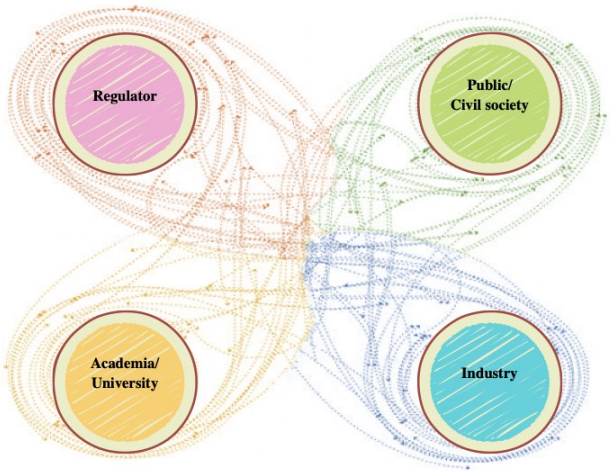

Fig. 1. The Quadruple Helix model. Adapted from [1].

2 Theoretical Framework

The transfer of knowledge from university to industry was seen as a "conditioning factor in a country's economic development" [2, p.72] . Yet, it was also seen as an issue with multifaceted implications, from an economic, political and cultural viewpoints [3]. From the standpoint of problems that society faces and how knowledge can best address them [4], for knowledge transfer to be economically beneficial for the society, the focus from a single source for knowledge, suggesting a linear model of knowledge, has changed to a multiple source, multi-directional perspective [5]. The creation of collaborative environments involving multiple diverse stakeholders is seen essential [6].

"Helix models" represent variant forms of collaboration that encourage the perspective of a knowledge society between the industry, university, government, civil society and the natural environment [7]. The "quadruple helix" coined by Carayannis & Campbell (2009) [8], adds a fourth helix; the "public", to the "triple helix" of industry, university, and government. The quadruple helix recognises the growing role public and civil society play in regional innovation projects [9], [10], and is characterised by bottom-up sets of public insights and top-down policies [11], [12]. The quadruple helix therefore puts greater focus on consumer needs at various stages of knowledge production, aggregating the demands into a final product or service [13]. One important reason for the inclusion of public is the changing competition situation of companies. Alternative strategies therefore must be sought, often involving a more direct involvement of the public [13].

Quadruple helix interactions help informing power relations and power issues that generally revolve around the exercise of influence, action legitimation, and resource control [14]. These interorganizational interactions can offer valuable insights into power relations with boundaries separating the actors from another [15], [16]. Knowledge transfer between diverse stakeholders poses considerable tensions with the conflicting motivations, and with stakeholders upholding their sector-specific interests, incongruent goals and objectives [17], [18], [19]. Companies and universities, for example, have always maintained their distinct identities and have not always been considered natural partners [20]. Both industry and academia operate in diverse ways giving rise to more tension and conflict [21], [22].

Knowledge boundaries have often created barriers to the flow of knowledge [23]. As a result, coordination problems escalated from interpretive differences [24]. Collaborative exploration necessitates the joint crossing of syntactic, semantic and pragmatic boundaries [25], and requires a process by which common interests are negotiated [17]. An interesting gap is that Carlile's framework of knowledge boundaries has rarely been applied to the analysis of inter-organizational knowledge flow across different helices [25].

The need for spanning boundaries requires collaboration agents that create commonality and the ability to speak the same language, in the sense of terminology and discourse, [26] and who may also convene power to bring different institutional spheres together [27], [28]. However, little is known about the contribution made by these intermediaries to the transfer of knowledge, particularly in the context of a collaboration that involve various stakeholders [29], [30], [16].

3 Research Design and Methods

The methodological process, depicted in Figure 2 below, starts with data collection followed by the constant comparative method that consists of three stages representing the essential elements of the "Glaserian" grounded theory methodology: (1) open coding, (2) selective coding, and lastly (3) theoretical coding [31]. The final stage in the process is writing the theory, where the theoretical outline or the conceptual framework is developed.

Fig. 2. Grounded Theory methodological process.

It is important to note that the usage of the coding stages to analyze data are not intended to be distinct and linear but involve several iterative cycles [32].

Semi-structured interviews were conducted with participants representing academia, the regulator and industry. An interview guide with flexible list of questions that varied with the flow of the interview was used. The interviews concentrated on four areas. The first focused on participant's professional background, their main role, and the main tasks associated with their role. The second area focused on the network dimensions, exploring the quadruple helix context and dynamics, key actors and the forms of knowledge transferred. The third area focused on the impact of knowledge boundaries; sector-specific interests, on the knowledge transfer process. The last and fourth area focused on how power flows between the different actors.

Data from interviews were collected, transcribed and accumulated looking for patterns to form categories of similar phenomena. The process of open coding began with identifying first level codes using line-by-line analysis [31]. Incidents were coded "into as many categories of analysis as possible, as categories emerge or as data emerge that fit an existing category" [33, p.105]. Constant comparison was then employed, where properties emerged and started to integrate [33]. Selective coding started by delimiting the core categories. Core categories are described as being central, relating to the majority of other categories [31]. Theoretical coding is the stage where relationships between the categories are established, resulting in two main properties - *tensions & gaps* in Quadruple helix interactions.

The last stage is where theoretical integration starts with "relating the theory to other theories in the same or similar fields" [2, p.12]. It is at this step where decisions are made on the direction and depth of theory under development, as well as the categories that need further investigation [33]. It is essential to see how the emergent theory relates to the existing literature, how it makes a contribution by extending prior knowledge [3], or else contradicts the existing literature as this may suggest new avenues for future research [3]. Similarities and connections will then be integrated to form a pattern and develop a conceptual framework [31].

4 Initial Findings and Discussion

The main sources of tension in the Quadruple helix were related to interaction and communication challenges, conflicts of interest, and power imbalances. Gaps emerged in terms of limited interactions involving all four helix actors; public/civil society in specific. Additionally, there were limited intermediation roles that exercised convening power to bring the institutional spheres together.

4.1 Tensions in Quadruple Helix interactions

Interaction/Communication Challenges. Questions regarding the inter-organizational knowledge transfer dynamics and associations revealed many examples on unidirectional/unilateral transfers and very few bi-lateral relationships. Participants described how limited and focused these unidirectional interactions are and how needs are generally initiated by one actor. Moreover, bringing the different stakeholders together to meet and share solid feedback was seen as problematic. The participants described other issues such as a lack of the technical knowledge required for fully comprehending stakeholder requirements. This may be considered another instance of miscommunication and misinformation.

Conflicting Interests. Sources of tension were mostly attributed to the incongruent goals, priorities, foci and objectives of the different stakeholders. These often further impeded their willingness to engage in joint development of knowledge. As the tension remained, stakeholders suggested engaging in more dialogic practices and meaningful interactions by aligning aims, objectives and interests. Participants believed that making offerings more relevant to the stakeholders' requirements and articulating their needs with visible changes would tackles these issues more effectively. Moreover, developing a trusting relationship was considered essential, in terms of knowledge input opportunities and common incentives. Developing a trusting atmosphere was therefore crucial for successful knowledge sharing and maintaining frequent interactions between the diverse groups.

Power Imbalance. The quadruple helix interactions helped informing on power relations and power asymmetry. Power issues were often more pronounced when considering inter-organizational knowledge transfer. In this study, asymmetries between the stakeholders, helped magnifying the regulators' power. These power imbalances have also emerged in the directional knowledge flow between the regulators and the other stakeholders. Academic regulators were found to have a predominant influence. The industry, however, had a marked impact on the knowledge sharing process as the HEI appeared to be heavily reliant and strongly dependent on the industry for expertise and experience. Distrust was seen to inhibit collaboration, as partners faced difficulty agreeing on a shared purpose and aligning objectives, especially with the increasing number of stakeholders. The creation of a trustful atmosphere was seen as a challenging exercise and one of the possible elements that can result in inequalities and power imbalances.

4.2 Gaps in Quadruple Helix Interactions

Limited Public Integration. Most of the interactions identified represented a double helix - academia-industry, academia-regulator, and a triple helix - academia-industry-regulator. Limited focus was given to quadruple helix interactions - academia-industry-regulator-society, specifically because consideration was given to the feedback from the public and the civil society, compared to the emphasis placed on seeking feedback from industry (i.e., the financial services sector). Public involvement was limited

to learners and government entities. In general, stakeholders were considered as less active in involving other civil society members.

The Overlooked Role of Intermediaries. Knowledge boundaries tended to aggravate coordination problems due to the different assumptions developed from interpretive differences. In the context of this study, the stakeholders do not recruit third parties, such as formal intermediary organizations, to undertake intermediary roles. They undertake these tasks themselves informally through their partners, business development teams, training managers, task force, faculty and learners. This is a consequence of the long-term alliances with the different stakeholders which can also eliminate barriers in communication. Several of the respondents thought recruiting third party intermediaries who could act as translators, would be a useful practice, as many of them lack the technical knowledge required for fully comprehending stakeholder requirements.

5 Conclusion

This paper contributes to previous research on knowledge transfer in helix models of collaboration by addressing two relatively under explored areas: i) the sources for knowledge boundaries that arise in these contexts and ii) the role of intermediaries in negotiating and in bridging these boundaries.

Most of the interactions identified in the preliminary phase of this study represented a double helix setting or a triple helix, while limited focus was given to quadruple helix interactions such as academia-industry-regulator-society. This could be attributed to the lack of consolidated processes allowing the involvement of public/civil society.

Sources of tension in the case study were mostly attributed to the incongruent goals, priorities, foci and objectives of the different stakeholders. These factors tended to impede their willingness to engage in joint development of knowledge. The creation of a trustful atmosphere was seen as a challenging exercise and one of the possible elements of power imbalances.

Knowledge boundaries were seen to cause coordination problems with the different assumptions developed from interpretive differences. To overcome such differences, stakeholders have informally undertaken intermediary roles, believing that their long-term alliances have helped reducing the boundaries between the institutional spheres and consequently the need for formal intermediaries.

Further research should explore the efforts of building public involvement and the role played by intermediaries to balance power relationships and aid knowledge transfer.

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